Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

April 20, 2007

Eric Blischke
Chip Humphrey
Project Managers
U.S. Environmental Protection Agency
811 SW Sixth Avenue, Third Floor
Portland, OR 97204

Re: **Yakama Nation's Submittal of Comments** *for the Portland Harbor RI/FS, Round 3 Lamprey (Lampetra sp.), Phase 1 Toxicity Testing Report prepared by LWG, dated April 6, 2007*

Dear Chip and Eric:

Attached are comments on LWG's Lamprey Phase 1 Toxicity Testing Report. The comments primarily focus on issues to consider during the upcoming review of the FSP and QAPP for Phase 2 of the lamprey toxicity tests. A couple comments are items requiring clarification or correction within the current report.

Thank you for your consideration of our comments. If you have questions please call me at 509-865-5121 x6365 or feel free to contact Sheila Fleming (RIDOLFI Inc.) at 206-682-7294.

Sincerely,

Rose M. Longoria

Rose Longoria
Superfund Projects Manager

Yakama Nation
Department of Natural Resources
Fisheries Resource Management Program

Attachment

DNR FRMP Superfund Projects/rml

MEMORANDUM

DATE: April 19, 2007

TO: Rose Longoria, Yakama Nation Fisheries

FROM: Sheila Fleming, P.E., RIDOLFI Inc.
Robert Dexter, Ph.D., RIDOLFI Inc.

SUBJECT: **Comments on the Portland Harbor RI/FS, Round 3 Lamprey (*Lampetra sp.*), Phase 1 Toxicity Testing Report prepared by LWG, dated April 6, 2007**

Ridolfi has reviewed the above referenced document and prepared the following comments. The comments fall into two general categories. The first set of comments addresses topics that do not necessitate changes to the report, rather identify issues that we will want to consider during our review of LWG's FSP and QAPP for the next round of toxicity testing. The second set of comments identify inconsistencies in the report that should be clarified and corrected.

Issues for Consideration in the Next Round of Testing

Overall the tests appear to have been performed as planned and the procedures and results were validated by independent groups. Our primary concern relates to laboratory personnel observations and interpretation regarding the health of the lamprey post-testing. For example, the report does not include a description of how 'live' versus 'dead' was determined. The copies of the Bench Sheets in Appendix II, Raw Data indicate that in most of the tests, surviving fish were observed to be exhibiting abnormal behavior, ranging from "quiescent," usually in fish from the higher concentrations that were counted as survivors (many of the fish that died were noted to be quiescent prior to death) to "twitching" and "erratic." There is an issue as to how the effects on the surviving fish that were apparently exhibiting signs of stress should be interpreted. Such information, while more difficult to quantify precisely, will help to better determine the real toxic response to the chemicals. LWG should provide detailed information in the FSP and QAPP about how this information will be reviewed and interpreted during the next round of toxicity testing.

The following table summarizes the ranges of concentrations bracketing the observation of mortality in the tests. All ammocoetes survived at the lower concentrations listed (the highest concentrations with no effects measured). For most of the substances all of the ammocoetes died within the first day from exposure to the next highest concentration (the lowest effective concentration). All ammocoetes died at least by the end of the 96 hours at the higher listed concentration for all of the test substances. From that standpoint the testing did establish the appropriate concentration ranges for the next test series.

Substance	Highest Measured No-effect Concentration, µg/l	Lowest-Measured Effective Concentration, µg/l	USEPA AWQC or Other Water Quality Protective Concentration, µg/l		Fish SMA†† µg/l
			Acute	Chronic	Acute
Copper	15	85	2.34*	1.45*	22 (RT)
Aniline	91,000	1,100,000		2.2**	
Pentachlorophenol	18	210	20†	13†	
Lindane	345	3,220	2	.08	
Diazinon	1,200	13,000	0.34	0.34	426 (RT)

* Water-quality dependent (2007 Revision)
** Canadian Water Quality Guidelines for the Protection of Aquatic Life
† pH dependent
†† Species Mean Acute Value
RT Rainbow Trout

To put these preliminary results in some context, included in the table are some selected toxicity reference values. The first two are simply the acute and chronic US EPA water quality criteria for the protection of freshwater organisms, with the exception of aniline for which a Canadian chronic value was used because no US EPA value is established. For most of the substances, the AWQC appear to be driven by their toxicity to crustacea, e.g. Daphnia. Therefore, also included are species mean average acute toxicity values for rainbow trout, which were readily available for copper and diazinon. Rainbow trout were about the most sensitive fish for which data were available for those two substances. Note also that there was no attempt to correct any of the water-quality-dependent concentrations to match test conditions.

Recognizing that the comparisons have many caveats, the range finding tests indicate that the ammocoetes may have similar sensitivities to copper and pentachlorophenol and less sensitivity to the other substances tested, compared to other aquatic biota including fish.

Other General Comments

As Chris Thompson noted, fairly large ammocoetes were apparently used in the tests: the sizes, measured only in the controls at the end of the testing, ranged from 49 mm to 90 mm in the toxicity tests and from 46 mm to 88 mm in the temperature sensitivity tests. Smaller ammocoetes might be more sensitive.

The summary statistics presented in the report for water hardness and alkalinity are somewhat misleading. Those parameters were only measured daily, were only measured on the water from the control beakers, and the values presented indicate that the measurements were low precision. For example, the reported alkalinity only varied by increments of 10, while hardness appeared to only be sensitive to changes or about 7 mg/l as Ca/CO3. Overall in the range finding tests these

limitations are probably not important, but in the next round, it may be important to improve the monitoring of those parameters, particularly if the water hardness will be decreased.

Comments Requiring Clarification or Correction

In Table 3-4 there seems to be slight discrepancies in the loading rates listed in the text and those shown in the table (part of "Organisms per Replicate" in the table).

On page 11, at the end of the first sentence, collection site water hardness ranged from 26 to 51 mg/l according to Table 2-1, not 20 to 51 mg/l.